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DEPARTMENT OF THE INTERIOR

UNITED STATES BUREAU OF MINES
JOHN W. FINCH, DIRECTOR

INFORMATION CIRCULAR

SHIFTS IN SOURCES OF CHROMITE SUPPLY

BY

ROBERT H. RIDGWAY

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By Robert H. Ridgway[2]

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WORLD PRODUCTION AND EXPORTS

Chromite has been produced commercially for slightly more than a century. Developed, at one time, chiefly as a chemical pigment raw material, it has subsequently found extensive application in other chemical industries - as a refractory material for furnace linings and as the sole source of the metal chromium. For some years prior to 1914, its use as a refractory predominated; but post-war development in alloy steels, principally stainless steels, enhanced the metallurgical demand in the form of ferrochrome with a consequent increase in the demand for chromite. More recently direct reduction of chromite in alloy-steel manufacture has been applied to a limited extent. Alloy steels containing varying amounts of chromium, with or without other alloying elements, now find extensive use in a wide variety of ways - in structural material, machines, industrial equipment, transportation by land, sea, and air, sanitary equipment, food preservation, and a multitude of other uses. In recent years chromium plating has had wide application and has become important industrially, but the amount of raw material consumed is small, due to the thinness of the layer of metal deposited (0.000002 to 0.05 inch). At present the principal demand for chromite is from the metallurgical industries, although consumption by the refractory industry is almost as great; chemical uses, including chromium plating rank third.

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[1] The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from U.S. Bureau of Mines Information Circular 6886."

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In response to increased demand from the iron and steel industry, world production of chromite expanded greatly, rising as early as 1914 to nearly 190,000 metric tons, or more than treble the output in 1900. In 1929, more than 600,000 tons were mined. Production naturally fell off during the subsequent years, but the full impact of the depression was not felt until 1932, and subsequent recovery was so rapid that by 1934 the output was again at a high level. Whereas many of the steel-alloying elements are found in commercial deposits in a few countries, chromite supplies are distributed rather widely. The world sources of chromite have moved from locality to locality, usually following the discovery and development of newer deposits or the depletion of old deposits. In historical order, the major production has shifted from the United States to Russia, to Turkey, to Russia, to New Caledonia, to Southern Rhodesia, and now back to Turkey again. As the twentieth century opened Russia, New Caledonia, and Turkey were the principal sources, with Russia the leading producer. New Caledonia's output soon exceeded and by 1906, was more than double that of Russia. This year (1906) likewise marked the beginning of significant production in Southern Rhodesia, which by 1910 had displaced New Caledonia as the largest source of supply. During the World War, Southern Rhodesia and New Caledonia continued to produce heavily while Russia and Turkey made diminishing outputs. India and the United States, on the other hand, expanded production, but the American industry was created by war conditions and collapsed promptly when this stimulus ceased.

Throughout the 1920's, Southern Rhodesia was by far the largest single source of chromite, contributing 43 percent of the total. During this period of great expansion in world production and trade Cuba, Greece, U.S.S.R., Yugoslavia, and the Union of South Africa increased their outputs and became important sources of supply. It was at this time that the Union of South Africa came into the picture as a significant factor, and by 1929 it was the second largest producer of chromite.

The five year depression period, 1930 to 1934, witnessed further shifts in the origins of chromite for world trade. Southern Rhodesia's output shrank from 42 percent of the total in 1929 to 9 percent in 1933, while New Caledonia held about the same relative position as before the depression. Probably the most striking feature indicated by the figures in table 1 is the fourfold increase in Turkish production from about 30,000 metric tons in 1930 to 120,000 tons in 1934, and this in the face of lessened demand and greatly restricted world exports. In the latter year Turkey was the principal producer of high-grade chromite. The only country challenging its position was the U.S.S.R. where the output rose to 129,200 metric tons in 1934, 15 percent more than in 1933. However, these tonnage figures are not strictly comparable because the bulk of the Russian output is of lower-grade ore, while that produced in Turkey is high-grade.

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TABLE 1. - World production of chromite, 1925-34, in metric tons

Country	1925		1926		1927		1928		1929		Average, 1925-29	
	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Cuba	30,309	10	36,598	10	17,256	4	34,248	8	53,799	9	34,442	8
Greece	8,079	3	20,049	6	17,314	4	20,953	5	24,214	4	18,122	4
India	38,053	12	33,918	9	58,125	15	46,185	10	50,361	8	45,329	10
New Caledonia	34,732	11	34,267	9	42,885	10	56,902	12	52,594	8	44,276	10
So. Rhodesia	123,220	40	164,376	46	197,782	49	199,060	43	265,909	42	190,069	44
Turkey	7,506	2	6,670	2	18,318	4	11,849	3	16,178	2	12,104	3
U.S.S.R. ...	30,111	10	30,362	8	19,294	5	29,536	6	52,889	8	32,439	8
U.S.Africa .	13,756	5	12,042	3	16,959	4	31,756	7	63,974	10	27,697	6
Yugoslavia ..	12,160	4	15,983	4	8,757	2	16,678	4	43,022	7	19,320	4
Miscellaneous	9,827	3	10,035	3	12,910	3	10,533	2	12,260	2	11,113	3
Total	307,753	100	364,300	100	409,600	100	457,700	100	635,200	100	434,911	100

Country	1930		1931		1932		1933		1934		Average, 1930-34	
	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Cuba	41,640	7	15,197	4	---	---	24,154	6	50,162	9	26,231	6
Greece	23,402	4	5,634	1	1,555	--	14,784	4	1/22,141	4	13,503	3
India	51,497	9	20,233	5	18,152	6	15,775	4	21,922	4	25,516	6
New Caledonia	61,894	11	74,150	18	60,000	20	41,000	10	47,275	8	56,864	13
So. Rhodesia	205,631	37	81,623	20	15,692	5	35,046	9	72,099	13	82,018	18
Turkey	29,525	5	55,216	13	55,196	19	75,379	19	119,844	21	67,032	15
U.S.S.R.	66,720	12	67,000	16	68,000	23	112,728	29	129,200	23	87,730	20
U.S. Africa ..	13,725	2	23,335	6	19,371	7	34,078	9	46,044	8	27,310	6
Yugoslavia	51,576	9	58,384	14	43,925	15	26,248	7	47,352	9	45,497	10
Miscellaneous	14,390	3	13,228	3	14,109	5	10,808	3	7,161	1	11,939	3
Total	560,000	100	414,000	100	296,000	100	390,000	100	563,200	100	444,640	100

1/ Exports. Production figures not available.

TABLE 2. - World exports of chromite, 1925-34, in metric tons

Country	1925		1926		1927		1928		1929		Average, 1925-29	
	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Cuba	30,309	12	36,598	13	17,256	6	34,248	9	53,850	10	34,432	10
Greece	9,760	4	19,764	7	16,010	5	17,262	5	20,121	4	16,584	5
India	49,098	20	40,592	14	43,642	14	46,035	13	32,891	7	42,452	12
New Caledonia.	18,500	8	23,593	8	42,885	14	56,899	16	59,423	12	40,260	12
So. Rhodesia .	131,950	54	157,629	54	163,471	52	164,872	45	255,173	50	174,619	51
Turkey	---	—	---	—	---	—	11,888	3	15,037	3	5,385	2
U.S.S.R.	---	—	---	—	2,329	--	3,048	1	8,639	2	2,803	--
U.S. Africa 1/	6,028	2	12,828	4	18,562	6	23,740	6	44,716	8	21,175	6
Yugoslavia ...	---	—	---	—	10,069	3	9,246	2	21,445	4	8,152	2
Total ...	245,645	100	291,004	100	314,224	100	367,238	100	511,295	100	345,881	100

Country	1930		1931		1932		1933		1934		Average, 1930-34	
	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Cuba	41,640	10	15,197	6	---	—	24,154	8	50,162	11	26,230	8
Greece	24,434	6	1,034	—	1,102	—	13,713	5	22,141	5	12,485	4
India	30,459	7	13,456	5	26,049	12	17,509	6	31,695	7	23,834	7
New Caledonia.	53,747	13	38,271	15	14,235	7	24,564	9	37,226	8	33,608	10
So. Rhodesia .	174,449	41	88,132	35	35,387	17	32,197	11	65,829	15	79,199	24
Turkey	28,348	7	25,382	10	55,216	26	88,000	31	130,000	29	65,389	20
U.S.S.R.	15,046	3	23,810	9	41,527	19	41,037	14	36,499	8	31,584	10
U.S. Africa ..	23,033	5	20,715	8	20,614	10	26,683	9	46,483	11	27,506	9
Yugoslavia ...	33,060	8	29,291	12	20,122	9	19,157	7	27,634	6	25,853	8
Total ...	424,216	100	255,288	100	214,252	100	287,014	100	447,669	100	325,688	100

1/ Including pyrites.

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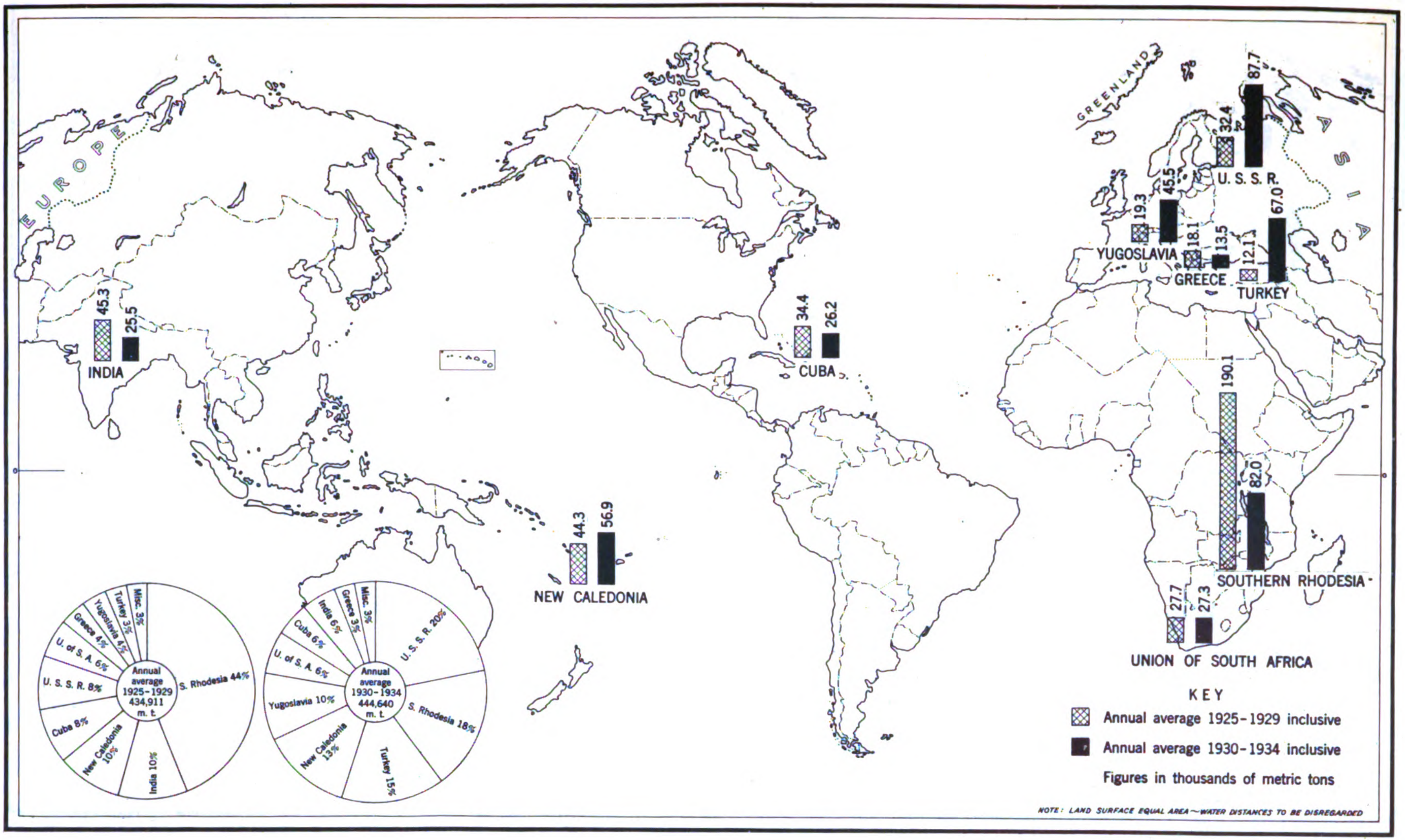

Figure 1.—Distribution of world chromite production.

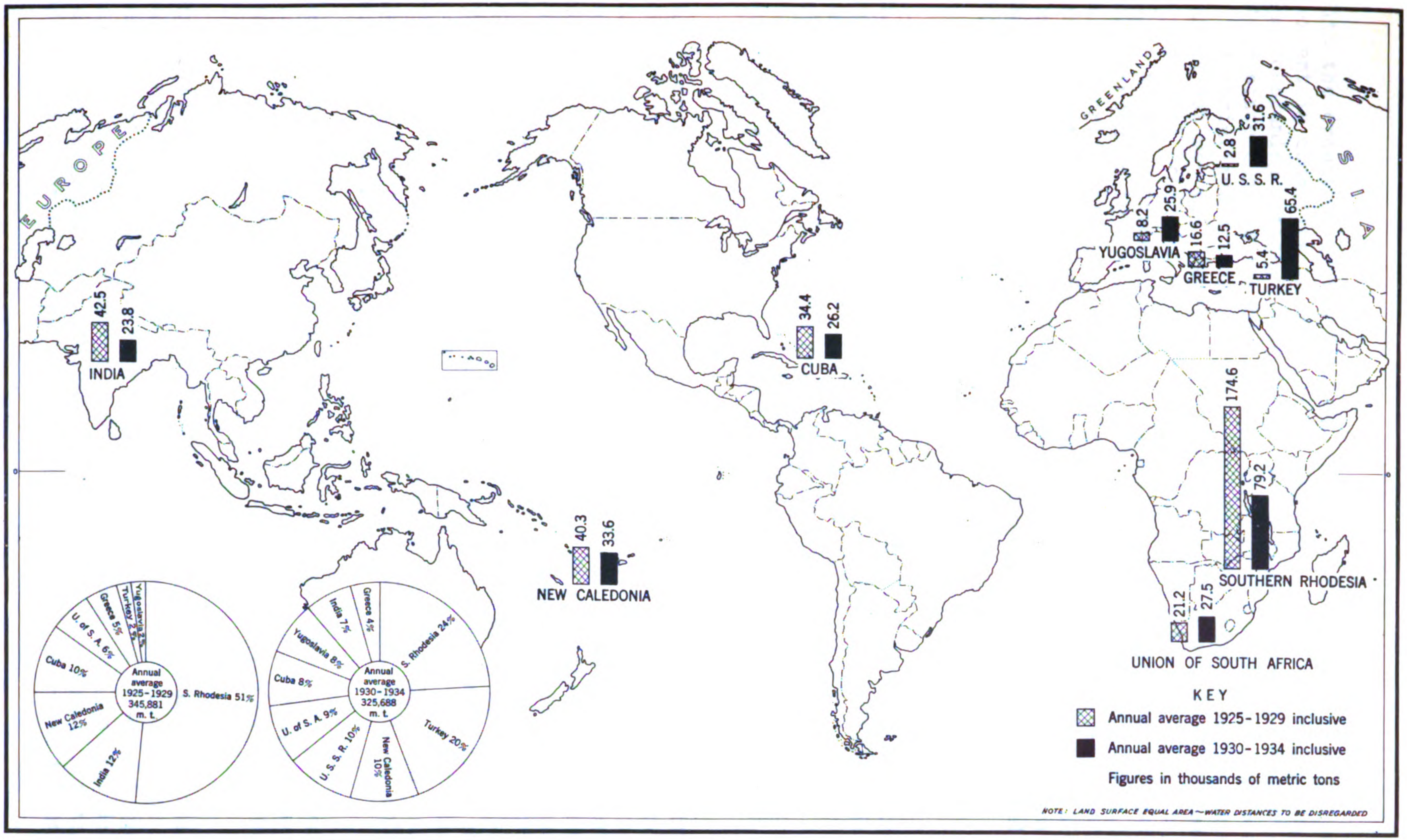

Figure 2.—Distribution of world chromite exports.

With the exception of the U.S.S.R., chromite is not produced to any great extent in countries in which it is consumed. The United States, the principal consuming nation, is no exception to this statement, as our domestic production since the war has been virtually nil. The chief consumers are the highly industrialized nations, whereas chromite is produced mainly in outlying areas not yet well-developed. (See fig. 1.) It follows that exports of the principal producing nations tend closely to reflect production trends as well as to show whence consuming nations get their supplies. Figures for the decade ended in 1934 are shown in table 2. While the demand for chromite dropped off during the depression, world exports in 1934 had recovered to such an extent that they were exceeded only by the record figure of 1929. This fact not only indicates the importance of chromite in our present industrial setup but also stresses the increasing utility (largely in alloys) of the metal chromium.

Turkey's Rise

The rise in Turkish exports from scratch in the early twenties to the position of premier exporting country in 1934 is striking. Exports in 1934 amounted to the record figure, for Turkey, of 130,000 metric tons, or 29 percent of the total world exports for that year. Although this figure is only 51 percent of Rhodesian exports for the year 1929, it exceeds the exports for any other country since 1930 and represents an increase of 48 percent over 1933.

The chromite exported from Turkey originates in several mining districts. The bulk of the output comes from around Dagardi and Eskishehir in northern Anatolia and from near Makri in southern Anatolia. Other deposits are known to exist in Turkey, and the improvement in railways and other transportation facilities, which undoubtedly has been a factor in the recent development of chromite operations, may bring about production from other areas. The deposits in southern Anatolia are much nearer the coast than those in the northern part of the country, and the ore drops to the coast by an aerial tramway about 7 miles long. In northern Anatolia the ore is carried several miles to the railway by aerial tram and thence 150 miles by rail to ports on the sea of Marmora. The bulk of the Turkish exports moves to European countries, the mines being operated by nationals of Germany, France, England, and Sweden, who ship largely to their own principals.

Turkish chromite is of good metallurgical grade; some of it is washed, but a large part is shipped as it comes from the mines. The ore is said to run from 46 to 64 percent chromic oxide; exports of Turkish ore to the United States in 1934 averaged 49 percent chromic oxide.

In addition to improving transportation facilities (a program that is now nearly completed), the Turkish Government has embarked upon other policies for fostering mining. The Eti Bank (Government owned) has been set up to do for mining and mineral development what the Sumer Bank is doing for industry. Taxes on chromite mining were reduced early in 1933 by reducing the taxes per unit of production on a sliding scale determined by an increase in output.

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On January 1, 1936, further stimulation was scheduled in the form of a system of premiums on exports of chromite. The premiums will be paid out of a fund to which producers themselves will contribute by a system of taxation.

Southern Rhodesia Gets Full Impact of World Slump

Another feature of the world chromite situation in recent years was the large drop in exports from Southern Rhodesia. During the period 1925 to 1929, inclusive, slightly more than half of the world's chromite came from this source, but during the succeeding pentad Rhodesia's contribution dwindled to less than one quarter of the world total. In actual quantities, the decline was from over 255,000 metric tons in 1929 to a low point of 32,197 tons in 1933. The 100 percent increase in 1934 resulted in a recovery to only 65,829 tons, an amount equal to 50 percent of the Turkish exports.

The bulk of the Rhodesian exports come from deposits near Selukwe and Mashaba and other localities along or near the Great Dike. The reserves are large and the ore is of good grade. Much of the ore is extracted by opencut methods, although there are some underground operations. Mining costs are low. Much of the ore is shipped as mined but some is concentrated to improve the quality. Some of the deposits have adequate transportation facilities to the Port of Beira, Portuguese East Africa, but the rail distance to this port from Selukwe, about 585 miles, of necessity adds very materially to the cost, which is augmented further by unloading and lightering charges at Beira before the ore starts its long journey by water to consuming points in the United States or Europe. Ores from some of the mines have shorter rail hauls, perhaps no more than 100 miles; on the other hand, there are deposits so remote from the railroad as to be hopelessly uneconomic under normal conditions.

During the depression a Government subsidy was granted on chromite mined in Rhodesia, but it was withdrawn subsequently because it failed to produce the desired result.

South African Ores Mainly Low-Grade

The Union of South Africa is a significant producer of chromite, and the rapid increase in its production and exports immediately before the depression commands attention. Production in this country began in 1924, and by 1929 exports were nearly 45,000 metric tons. Exports dropped 50 percent during the depression years but by 1934 had again reached more than 46,000 tons. For the 5-year period 1930-34 exports were 9 percent of the world total, while for the preceding 5-year period they amounted to 6 percent.

Virtually all the South African chromite comes from districts near Lydenburg and Rustenburg in the Transvaal and is shipped from Lorenzo Marquez in Portuguese East Africa. Inasmuch as the ores are comparatively low-grade, containing about 43 percent Cr_2O_3, they are used mainly for chemical and refractory purposes. Mining is done both by underground and opencut methods, and reserves are extensive. Owing to lower mining and transportation costs the ore can be sold at a considerably lower price per unit of chromium than Rhodesian ores. Before the depression they were offered at about 25s[3] per ton below the c.i.f. price of high grade Rhodesian ore. A bridge over the Steelport River, begun during 1934, will facilitate the movement of ores in the Lydenburg district from the mines to the railhead.

The bonus of 7 percent granted to base metals exported for the Union applies to the chromite industry.

Within the last few years a smaller amount of high-grade ore has been produced in the Isitilo Range in Natal. Shipments from this district in the first half of 1935 averaged 52 percent Cr_2O_3. It has been found that ores from this district can be improved by crushing and concentrating on Wilfley tables, which eliminates a large percentage of the silica and other ingredients.

New Caledonia Supplies Chemical Ore

Although exports from New Caledonia dropped during the depression, they maintained about the same relative position (10 to 12 percent of world total) during the depression years, 1930-34, as in the preceding 5-year period. Earlier in the 1920's, New Caledonia supplied a much larger part of the world's requirements.

New Caledonia is the principal source of high-grade ore required by the chemical industry; domestic and foreign trade journals carry price quotations on New Caledonian chrome ore averaging as much as 55 to 57 percent Cr_2O_3. Chromite imported into the United States from New Caledonia in 1934 averaged 50 percent chromic oxide. This ore, in addition to being used for chemicals, is of good metallurgical grade. The most important mine, owned by the Societe Tiebaghi, is at Paagoumene, where much of the ore extracted is said to run 56-1/2 percent Cr_2O_3. The nearby Fantouche mine, owned by an American concern, also is an important producer. There is another operator in the same region, but its output is small and is delivered to the Societe Tiebaghi under contract. Mining is done by underground methods, and the ore is transported short distances to the coast by overhead cables or narrow-gage rail systems. The distance from the mines to the coast does not exceed 8 kilometers. The ore is loaded into barges and lightered to ship's side. Virtually all of the chromite ore is shipped from Paagoumene and Nehoue on the west coast of the north end of the Island. In the southern part of the Island several small deposits of chromite are being worked. Chromite mined in New Caledonia pays an extraction and an export tax of 9 percent ad valorem.

Cuban Ore For Refractories

The Cuban chromite industry started during the World War but declined immediately afterward. However, with the development of the refractory grade deposits near Camaguey, production was revived in 1923 and has since been quite substantial. Cuba, although making no shipments in 1932, supplied 8 percent of the world's exports from 1930 to 1934 compared with 10 percent in the preceding 5-year period.

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[3] Mining and Industrial Magazine of South Africa, The Position of Union Chrome Ore: Vol. 13, no. 12, Feb. 3, 1932, p. 892.

The bulk of the output of Cuba comes from the district around Camaquey, where American concerns are operating. The chromite is low-grade, about 33 percent Cr_2O_3, but is used in the manufacture of refractories. The ore is mined cheaply from shallow deposits near the Cuba Railroad, which hauls the chromite about 50 miles to the port of Nuevitas on the north coast for delivery by steamer to Philadelphia or Baltimore. Less-important deposits exist in Oriente and Mantanzas Provinces.

Russian Reserves Abundant But Low-Grade

The U.S.S.R. obtains its requirements of chromite from domestic mines and exports material quantities to other world markets. In pre-war time Russia was a large factor in the international chromite market. There were no shipments of chromite out of the U.S.S.R. from wartime until 1927. Subsequently exports increased rapidly, reaching a peak of 41,527 metric tons in 1932, or 19 percent of world exports. During the period 1930 to 1934 the U.S.S.R. supplied 10 percent of world exports.

Reserves of chromite in the U.S.S.R. are reported to be large (15,000,000 tons), but the ore generally is low-grade, and only the higher grades are exported, although some of the 40 percent ores have been shipped. Imports of Russian ore into the United States in 1934 contained 45 percent Cr_2O_3. The principal source of production in Russia is in the Ural Province, where mechanization of mines and treatment processes increased production. These ores, however, must be transported long distances by rail to the seacoast for overseas export. The region around Khalilovo in Bashkir has recently been the leading Russian source of high-grade chromite. Khalilovo is 900 kilometers from the Black Sea port of Navorossisk, the principal port of export of Russian chromite.

British India

India is furnishing less of the world's requirements than formerly. In the period 1930-34, its share of world exports amounted to 7 percent, compared with 12 percent in the preceding pentad and 21 percent for the 5-year period 1920-24. Exports for 1934, however, were the largest since 1929.

Indian ores are high-grade, usually carrying more than 50 percent Cr_2O_3. The output comes from Baluchistan, Mysore, and Bihar and Orissa and is exported from Karachi, Calcutta, Port St. George, and the Portuguese port of Goa. Baluchistan chromite is particularly desirable for electric furnace work. The rail haul to the ports varies from 250 up to 600 miles. The principal deposits are in Mysore with smaller deposits in Baluchistan and still smaller deposits in Bihar and Orissa.

Southern Europe

Production in Yugoslavia may be said to have begun in 1925, but territory included in Yugoslavia after the war had produced chromite in small amounts for many years prior to 1914. Shipments to foreign countries followed

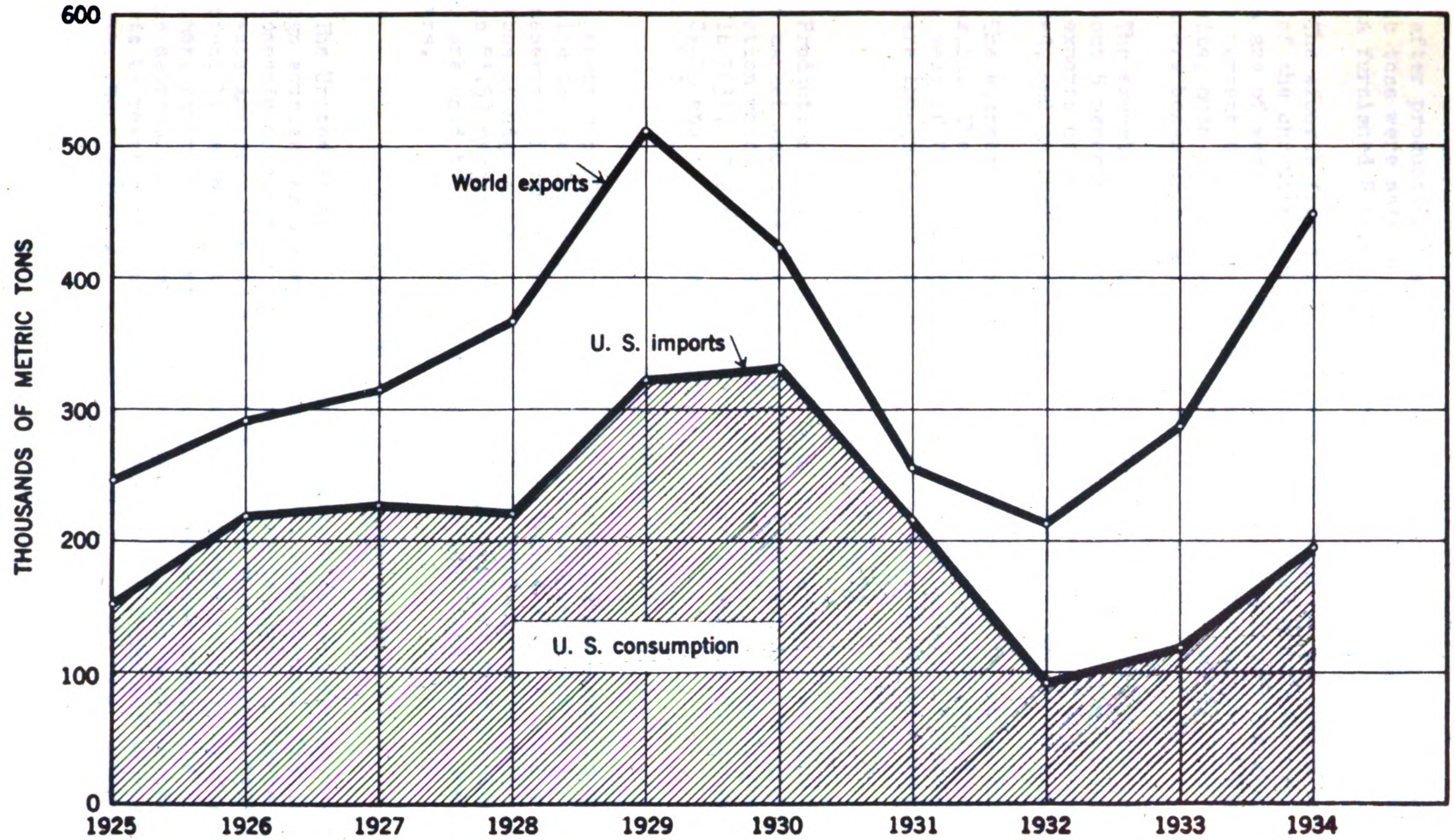

Figure 3.—World exports and U. S. imports of chromite.

soon after production began, the peak export year being 1930, when 33,060 metric tons were shipped. During the period 1930 to 1934, inclusive, Yugoslavia furnished 8 percent of the world exports.

The exports from Yugoslavia come from mines in the region around Skoplje. Some of the chromite is hand picked or shipped as mined; the remaining shipments are of washed ore. The crude ore to the concentrating plants runs 24 to 40 percent Cr_2O_3, but all shipments from Yugoslavia are of high-grade chromite, much of it being of metallurgical grade. During 1929 the Yugoslav producers began using Saloniki as a port of export.

The exports of chromite from Greece for the last 10 years have amounted to about 5 percent of the world total. During the depression years 1931 to 1932 exports dropped to a little over 1000 tons per year but have since recovered, and in 1934 amounted to 22,141 tons or 5 percent of the world exports.

The sources of chromite in Greece are in Thessaly and on the Khalkidike peninsula. The principal mine in Greece is in Thessaly near Pharsala, 30 miles west of Volo, the port from which Thessalian ore is exported. Greek ores are low-grade and are said to contain 38 to 40 percent chromic oxide.

Japanese Production Small

Production in Japan never has been large enough to be important in the world market and does not suffice for local needs. Imports roughly equal production which amounted to 19,897 tons in 1933, or slightly more than double that in 1931. There are no exports; the ore is relatively low-grade (40 percent Cr_2O_3) and is consumed locally.

Philippines

Recent reports from the Philippines indicate considerable development of chromite in the islands. Exploration work has been going on for several years, and reserves of some magnitude have been blocked out. A trial shipment of 500 tons of high-grade ore shipped to the United States in 1935 was reported to run 53.59 percent chromic oxide and 14.43 percent ferric oxide. Present plans are said to provide for shipment of 25,000 tons yearly over the next 4 years.

United States Imports Supplies

The United States, the largest chromite consumer, depends entirely on foreign sources, as domestic production is insignificant. The importance of the domestic consumption in the world picture is shown in figure 3, which contrasts American imports with world exports for the decade 1925 to 1934. The trend lines show that while the United States is still by far the largest consumer, exports to other countries have increased during the latter part of the depression. Domestic requirements during the post-war period caused imports to reach a peak of 331,860 metric tons (78 percent of world exports) in 1930. During the next 2 years imports dropped sharply, amounting to only

90,574 tons (42 percent of world exports) in 1932. Although imports had recovered 100 percent, to 195,383 tons, in 1934, their relation to world exports varied but little, being 41 percent in 1933 and 44 percent in 1934 compared with 66 percent for the pentad 1925-1929. To what extent the increased takings by European nations in the last few years reflect stocking of this strategic commodity for emergency purposes is not known, but indications are that intensified armament activities by the great military powers made new and large demands on the chromite industry.

The countries from which we obtained our chromite during the last 10 years are shown in table 3. Some of the ore credited to other countries in the table represents transshipments from some of the countries named but the remainder originated in countries not listed.

Examination of the above figures reveals changes in the sources of supply for our domestic industries. Nearly 60 percent of our requirements during the period 1925-29 were met by imports from British Africa (Southern Rhodesia and the Union of South Africa) but in the succeeding 5-year period slightly less than one-third came from this source. Cuba maintained the same relative position during the two periods while India showed a decrease. Increased imports are credited to Greece, New Caledonia, Turkey and the U.S.S.R. The figures, as given by the Bureau of Foreign and Domestic Commerce, for the imports into the United States from Greece exceed the amounts given as total exports from Greece in their official figures. Movement of Yugoslavian ore out of the Port of Saloniki undoubtedly is credited to Greece in our import statistics.

Imports of chromite into the United States enter through Atlantic Coast ports and are used largely in the industrial States in the north-eastern part of the country. The bulk of the movement comes into New York, Baltimore, and Philadelphia, although in some years considerable ore has come into Virginia.

TABLE 3. - Imports of chromite into the United States, 1925-34, by countries, in metric tons

Country	1925		1926		1927		1928		1929		Average, 1925-1929	
	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Cuba	30,309	20	36,598	17	17,255	8	34,248	16	53,799	17	34,442	15
Greece	12,734	8	21,403	10	22,889	10	17,427	8	27,075	8	20,306	9
India	8,494	6	14,021	6	13,790	6	17,873	8	21,370	7	15,109	7
New Caledonia	2,065	1	11,325	5	11,685	5	15,397	7	27,277	8	13,550	6
British Africa[1]	90,612	60	124,738	57	137,965	61	129,870	59	187,894	59	134,226	59
Turkey	---	--	---	--	---	--	203	--	1,727	--	386	--
U.S.S.R.	---	--	---	--	---	--	---	--	---	--	---	--
Yugoslavia ..	---	--	---	--	---	--	---	--	---	--	---	--
Other countries ..	7,928	5	10,787	5	22,345	10	5,050	2	3,586	1	9,939	4
Total	152,142	100	218,922	100	225,929	100	220,068	100	322,728	100	227,958	100

Country	1930		1931		1932		1933		1934		Average, 1925-1929	
	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Cuba	41,640	13	15,197	7	---	--	24,153	20	50,163	26	26,231	14
Greece	46,557	14	29,357	14	16,658	19	11,683	10	23,675	12	25,586	13
India	14,775	4	8,803	4	7,983	9	4,219	4	406	--	7,237	4
New Caledonia	31,520	10	40,214	19	11,735	13	15,393	13	19,843	10	23,741	13
British Africa[1]	172,815	52	74,852	35	15,745	17	13,398	11	49,632	26	65,288	34
Turkey	2,633	1	2,233	1	17,835	20	28,301	24	29,191	15	16,049	8
U.S.S.R.	14,101	4	18,021	8	4,877	5	13,474	11	20,257	10	14,146	7
Yugoslavia ..	---	--	---	--	---	--	5,616	5	---	--	1,123	1
Other countries ..	7,819	2	27,262	12	15,691	17	2,144	2	2,216	1	11,026	6
Total ..	331,860	100	215,939	100	90,574	100	118,381	100	195,383	100	190,427	100

1/ Southern Rhodesia and Union of South Africa.

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